Sustainability at Thomas Built Buses.

ZERO WASTE -TO- LANDFILL MANUFACTURING

by Alice Wesselman-Rimmer

May 9, 2012

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Background: Thomas Built Buses

Predecessor: **Perley A. Thomas Car Works** (1916),

Founded 1972 (as Thomas Built Buses, Inc.)

Headquarters 1408 Courtesy Road High Point, North Carolina, 27260

Products: School buses**,** Commercial buses and Specialty Vehicles

Employees: 1,300+

Facilities in High Point: Courtesy Rd> 683,700sq ft, and Fairfax Rd> 450,600 sq ft.

Parent: Daimler Trucks North America, LLC Portland, Oregon

Website **http://www.thomasbus.com/**

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Why “Zero Waste-to-Landfill?”

- **Sustainability movement** – ISO14001 and Daimler require sustainability of their organizations.
- Part of the “**Six Sigma**” resource reduction and productivity enhancement movement
- When implemented it **reduces cost** of waste management through waste reduction, resource re-use and recovery from recycling .
- Environmentally reducing manufacturing footprint.

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Why “Zero Waste-to-Landfill?”

Thomas Built Buses and Daimler Truck North America (DTNA), are members of:

- EPA ‘s WASTE WISE program

- NC Environmental Stewards program

These programs require waste reduction & recycling benchmarking.

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“Zero waste-to-landfill”

ZERO WASTE TO LANDFILL MANUFACTURING PROCESS:

- Identification of all waste streams
- Grouping waste streams that to be recycled together
- Finding and developing recycling vendors for identified streams
- Developing a model program for site-wide implementation through training and benchmarking between operation areas.
- Source Reduction to decrease waste streams.
- Review of cost impact and environmental footprint.
- *Plan, Do, Check, Act continuous cycle*

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Identification of all waste streams

Because every mile matters.SM

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Identifying waste streams

- WOOD WASTE
- CARDBOARD
- PAPER
- PACKAGING PLASTICS
- TUBING AND PLASTIC PARTS
- METAL SCRAP
- OFFICE MATERIALS
- UNIVERSAL WASTE
- HAZARDOUS WASTE
- Miscellaneous – ie: kitchen grease.

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s, Inc.
17
ONLY
CTP

“Dumpster diving” area by area to discover opportunities

Metal segregation improvements decrease total waste poundage significantly

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PLASTICS

(Bags, Bubble Wrap, Shrink Wrap, Air Packing, Stretchy Type Plastics)

DO NOT CONTAMINATE with Food Wrappers or Regular Trash

PLASTIC

BAGS / WRAP

D.Bradshaw

3-18-09

PLASTICS RECYCLING

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Pneumatic hoses

Finding similar plastic streams for recyling

Grouped like plastics to simplify handling

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Black and White Bands Only

NO GREEN BANDS

DO NOT CONTAMINATE

NO TRASH

ETC.

BLACK & WHITE PACKING BANDS

D.Bradshaw

3-18-09

PLASTICS RECYCLING

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ALUMINUM CANS Only

DO NOT CONTAMINATE

NO REGULAR TRASH

ALUMINUM CANS

D.Bradshaw

x

x

METAL RECYCLING

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“PAINTED MASKING PAPER & PLASTIC” ONLY

TO BE BALED !!

NO OTHER REGULAR TRASH IN THIS CONTAINER

WASTE TO ENERGY
Waste Stream # 1

PAINTED MASKING PAPER &

D.Bradshaw

x

x

PAINTED MASKING PAPER & PLASTIC

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Identifying waste streams

- WOOD WASTE
- CARDBOARD
- PAPER
- PACKAGING PLASTICS
- TUBING AND PLASTIC PARTS
- METAL SCRAP
- OFFICE MATERIALS
- UNIVERSAL WASTE
- HAZARDOUS WASTE
- Miscellaneous – ie: kitchen grease.

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Waste Stream **Reduction**

Thomas BUILT BUSES®

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Look for Opportunities to reduce parts packaging.

Windshield Crates – investigating using returnable steel crates

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Replaced cardboard packaging for tank part with

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Waste Stream **Collection**

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Cardboard compactor

Office Recycling

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RECYCLE
RECYCLE
DEPT 95

MISCELLANEOUS PLASTICS ONLY
Caps / Aerosol Can Tops / Drill Bit Cases Etc.
IF NOT IN PICTURE THEN DO NOT PUT IN THIS CONTAINER
DO NOT CONTAMINATE
PLASTICS
Gojo

“FOAM SHEETS” ONLY

DO NOT CONTAMINATE

NO REGULAR TRASH

FOAM SHEETS

D.Bradshaw

FOAM SHEETS

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USED AEROSOL CANS
USED ENERFOAM CANS

Used / Damaged Aerosol Cans - To Be Recycled
EnerFoam Cans
To Be Shipped For Incineration
USED AEROSOL CANS
USED ENERFOAM CANS

SCRAP COPPER &
SCRAP COPPER & BRASS
USED DRILL BITS
USED DRILL BITS
SCRAP COPPER & BRASS

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
OFFICE
PAPER
PLASTICS
PLASTIC "ZIP TIES"
OFFICE PAPER
VISUAL AID BOARD
RECYCLE CENTER

Implementation **Training**

Thomas BUILT BUSES®

Because every mile matters.SM

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Back to Basic's Training Day

- All employees had 55 minutes of training to go over the ECO checklist and Recycling processes.
  - Use "SINGLE POINT LESSONS" so anyone walking in the area knows purpose of collection containers.
  - Use the area team(s) to perform weekly ECO Checklist , similar to safety walks or daily operational checklists.
  - These are posted at the area, and beyond to escalate repetitive problems.

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SIDELINING / HEADLINING - TPM BOARD
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
OFFICE
"ZIP TIES" ONLY
"OFFICE PAPER" ONLY
PLASTICS
VISUAL AID BOARD
RECYCLE CENTER
Single Point Lessons
Poke-Yoke

ECO Checklist

Environmental Checklist

On Target OFF target Not Applicable

	Week 1	Week 2	Week 3	Week 4	Week 5
1. Chemicals are stored in a closed container with a tight fitting lid when not in use.					
2. Containers are properly labeled according to contents. (including hazardous waste piping)					
3. The area is free of unnecessary chemical containers and storage.					
4. Waste containers and the surrounding floor are in good condition and properly labelled					
5. Only 55-gallons of hazardous waste (or less) are present in the work area.					
6. Containers of hazardous and flammable waste are stored correctly for compatibility, in closed containers, and in					
7. Proper spill equipment is available in the event of a spill. (Look in spill kit and make sure supplies are available.)					
8. Used oils, lubricants, antifreeze, etc. are properly labeled as "USED OIL."					
9. Secondary containment is available in the event of a chemical spill. (Chemicals are not close to doors.)					
10. Areas are free of spills, drips or leaks.					
11. Lights, equipment and fans are turned off when not in use.					
12. Doors are closed during the heating and cooling season.					
13. Compressed Air or other gas leaks are identified.					
14. Heaters are turned off when not in use.					
15. Recycleables and Trash are in the correct containers					
16. Recycling bins are present and clearly marked.					
17. Recyclable materials such as batteries and light bulbs are stored in closed containers and labeled "UNIVERSAL					

Instructions

1. The checklist will be completed weekly by the Team Leader for the area. Once completed, the Team Leader will post the results on the team board.
2. Issues will be corrected as soon as possible.
3. PDCA process will be followed for repetitive items or items that can't be resolved promptly.

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"TEAM" LEVEL WEEKLY ECO CHECKLIST TRACK

Color Circles in GREEN or RED – Results from ECO CHECKLIST

** Completed by Wed of each week **

MONTH:

DEPT #:

TEAM #:

At least one "X" noted on Eco Checklist. Caused entire weekly score for that team to be RED.

All 18 questions (ones that are applicable) were scored with "Checks". Therefore, team score for week was GREEN.

WEEK # 1 of Month

(First Wed of Month)

WEEK # 4 of Month

WEEK # 2 of Month

WEEK # 3 of Month

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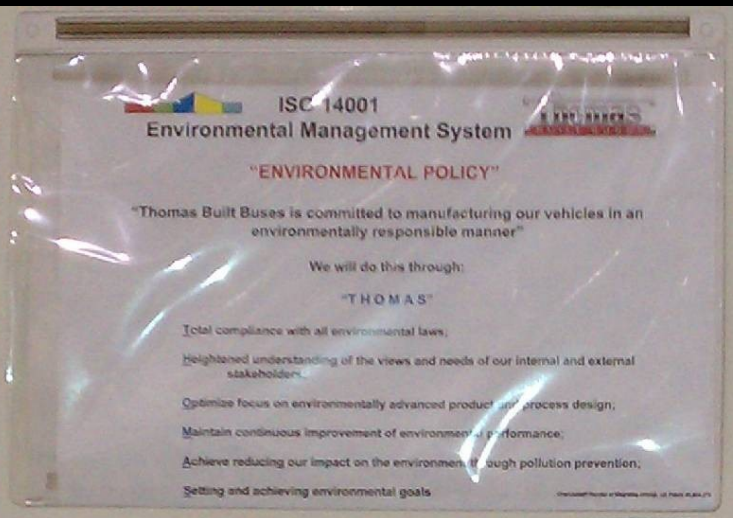
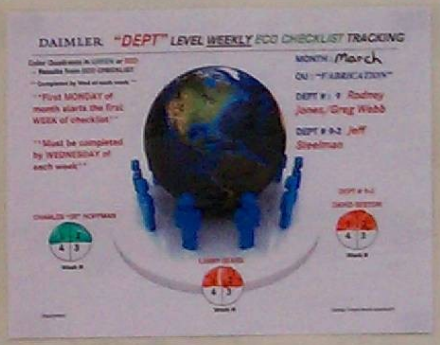
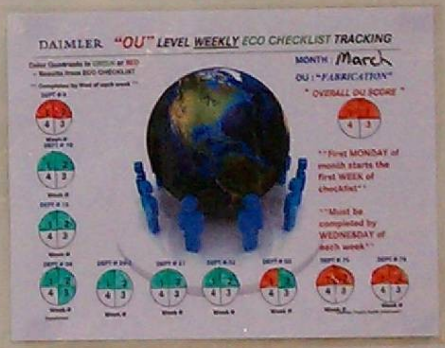

ISO 14001
Environmental Management System
"ENVIRONMENTAL POLICY"
"Thomas Built Buses is committed to manufacturing our vehicles in an environmentally responsible manner"
We will do this through:
"THOMAS"
Total compliance with all environmental laws;
Heightened understanding of the views and needs of our internal and external stakeholders;
Optimize focus on environmentally advanced product and process design;
Maintain continuous improvement of environmental performance;
Achieve reducing our impact on the environment through pollution prevention;
Setting and achieving environmental goals

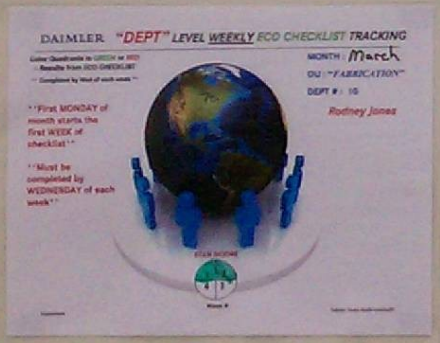
Month to Month
TBB OVERALL
Recycling %
100


DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
DEPT # : 9 Rodney Jones/Greg Webb
DEPT # 9-2 Jeff Steelman

DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
DEPT # : 24
Tommy Wilson

DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
DEPT # : 32
Rodney Jones


DAIMLER "OU" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
" OVERALL OU SCORE "

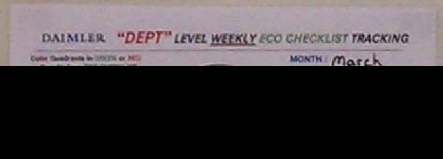

DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
DEPT # : 10
Rodney Jones

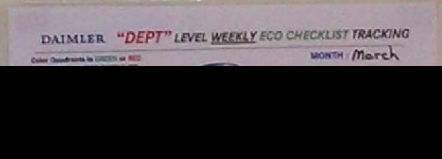
DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
DEPT # : 26-2
Jeff Steelman

DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March
OU : "FABRICATION"
DEPT # : 55
Tommy Wilson

DAIMLER Monthly ECO CHECKLIST TRACKING
OU : "FABRICATION"
YEAR: 2011
DEPT #
9
10
15
24
26-2
31
32
55
75
76

DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March


DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March


DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March

DAIMLER "DEPT" LEVEL WEEKLY ECO CHECKLIST TRACKING
MONTH : March

Recycling Vendor Development

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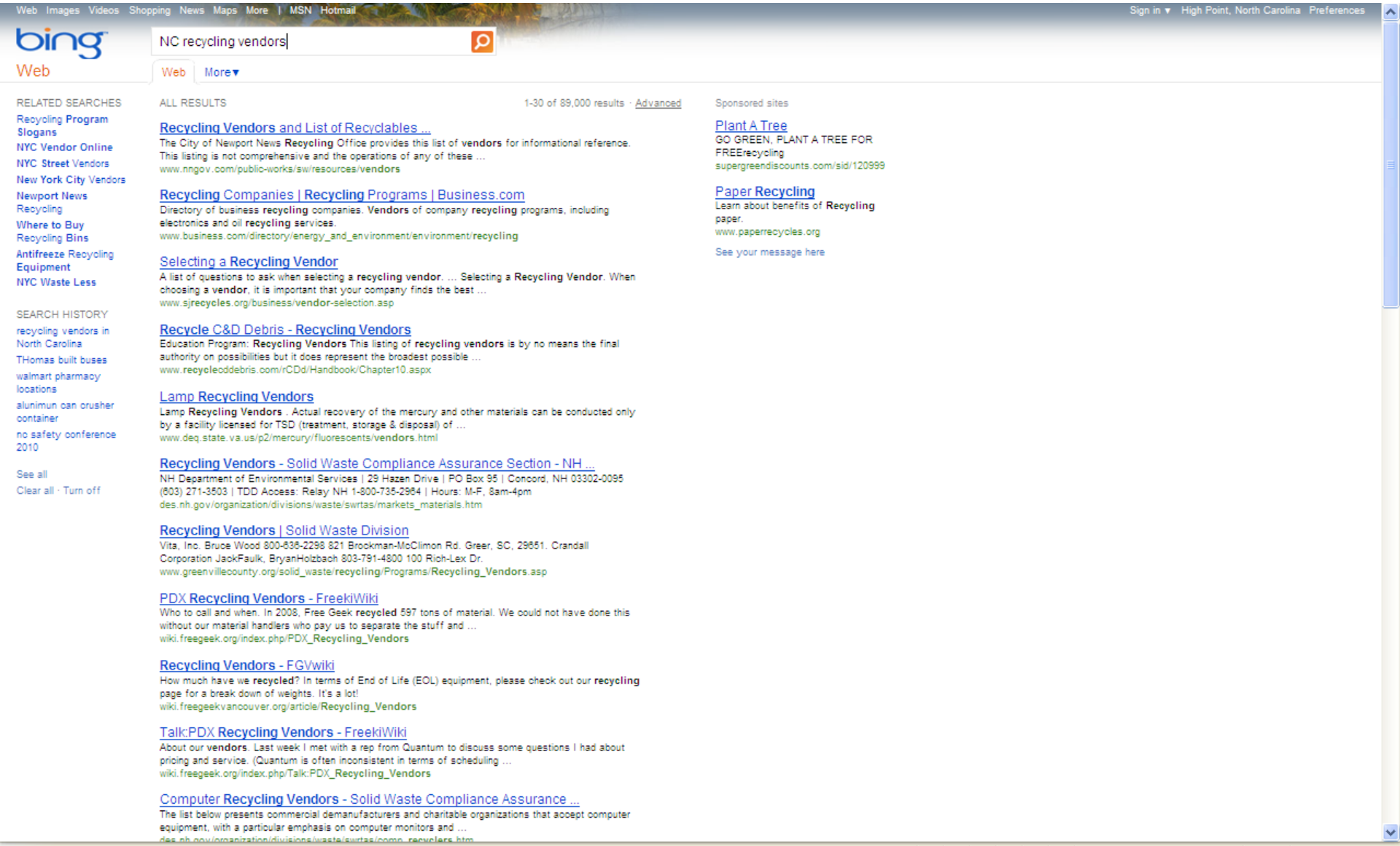
WEB Searches for vendors – *overload misc info*


Web Images Videos Shopping News Maps More | MSN Hotmail
Sign in ▾ High Point, North Carolina Preferences
bing
Web
NC recycling vendors
Web More▾
RELATED SEARCHES
Recycling Program Slogans
NYC Vendor Online
NYC Street Vendors
New York City Vendors
Newport News Recycling
Where to Buy Recycling Bins
Antifreeze Recycling Equipment
NYC Waste Less
SEARCH HISTORY
recycling vendors in North Carolina
THomas built buses
walmart pharmacy locations
alunimun can crusher container
nc safety conference 2010
See all
Clear all · Turn off
ALL RESULTS
1-30 of 89,000 results · Advanced
Recycling Vendors and List of Recyclables ...
The City of Newport News Recycling Office provides this list of vendors for informational reference. This listing is not comprehensive and the operations of any of these ...
www.nngov.com/public-works/sw/resources/vendors
Recycling Companies | Recycling Programs | Business.com
Directory of business recycling companies. Vendors of company recycling programs, including electronics and oil recycling services.
www.business.com/directory/energy_and_environment/environment/recycling
Selecting a Recycling Vendor
A list of questions to ask when selecting a recycling vendor. ... Selecting a Recycling Vendor. When choosing a vendor, it is important that your company finds the best ...
www.sjrecycles.org/business/vendor-selection.asp
Recycle C&D Debris - Recycling Vendors
Education Program: Recycling Vendors This listing of recycling vendors is by no means the final authority on possibilities but it does represent the broadest possible ...
www.recycleoddebris.com/rCDd/Handbook/Chapter10.aspx
Lamp Recycling Vendors
Lamp Recycling Vendors . Actual recovery of the mercury and other materials can be conducted only by a facility licensed for TSD (treatment, storage & disposal) of ...
www.deq.state.va.us/p2/mercury/fluorescents/vendors.html
Recycling Vendors - Solid Waste Compliance Assurance Section - NH ...
NH Department of Environmental Services | 29 Hazen Drive | PO Box 95 | Concord, NH 03302-0095 (603) 271-3503 | TDD Access: Relay NH 1-800-735-2964 | Hours: M-F, 8am-4pm
des.nh.gov/organization/divisions/waste/swrtas/markets_materials.htm
Recycling Vendors | Solid Waste Division
Vita, Inc. Bruce Wood 800-636-2298 821 Brockman-McClimon Rd. Greer, SC, 29651. Crandall Corporation JackFaulk, BryanHolzbach 803-791-4800 100 Rich-Lex Dr.
www.greenvillecounty.org/solid_waste/recycling/Programs/Recycling_Vendors.asp
PDX Recycling Vendors - FreekiWiki
Who to call and when. In 2008, Free Geek recycled 597 tons of material. We could not have done this without our material handlers who pay us to separate the stuff and ...
wiki.freegeek.org/index.php/PDX_Recycling_Vendors
Recycling Vendors - FGVwiki
How much have we recycled? In terms of End of Life (EOL) equipment, please check out our recycling page for a break down of weights. It's a lot!
wiki.freegeekvancouver.org/article/Recycling_Vendors
Talk:PDX Recycling Vendors - FreekiWiki
About our vendors. Last week I met with a rep from Quantum to discuss some questions I had about pricing and service. (Quantum is often inconsistent in terms of scheduling ...
wiki.freegeek.org/index.php/Talk:PDX_Recycling_Vendors
Computer Recycling Vendors - Solid Waste Compliance Assurance ...
The list below presents commercial demanufacturers and charitable organizations that accept computer equipment, with a particular emphasis on computer monitors and ...
Sponsored sites
Plant A Tree
GO GREEN, PLANT A TREE FOR FREErecycling
supergreendiscounts.com/sid/120999
Paper Recycling
Learn about benefits of Recycling paper.
www.paperrecycles.org
See your message here
Done
Internet
75%

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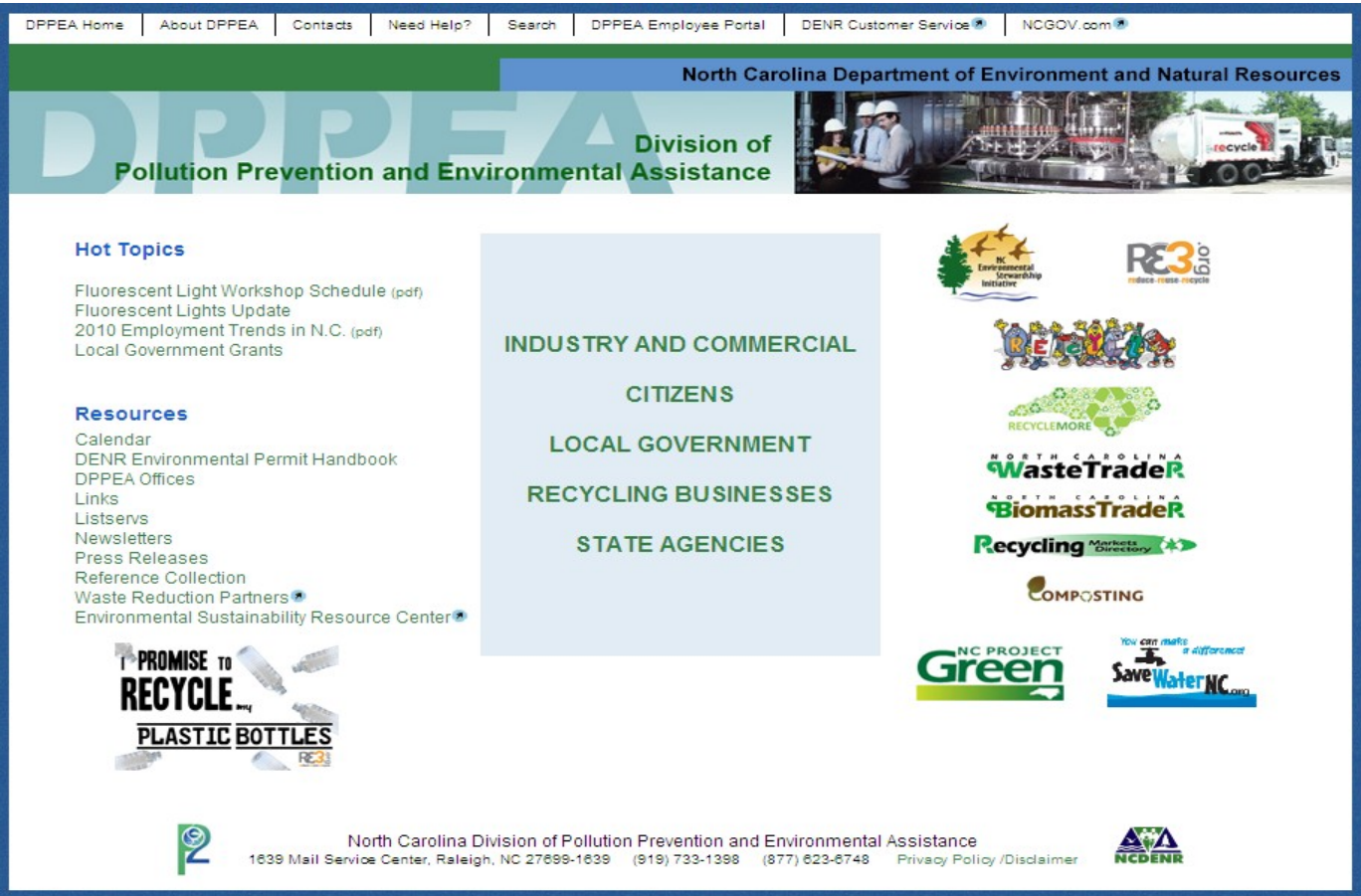
NC Pollution Prevention Recycler list service

http://www.p2pays.org



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Example of a list service

NORTH CAROLINA
Recycling Markets Directory
RBAC Home
Search Directory
Get Listed
N.C. WasteTrader
Links
Search Directory: Use this as a tool to find an outlet for your recyclable materials. If you're not sure under which category to find your material, see our complete LIST of materials.
By material. Select the general type of material you want to recycle from the drop-down list below, then click "Go."
STEP 1
ABC Container Recycling
Go
By name. If you know the name of the recycling company you seek, please select the first letter of the company's name:
1 , 3 , 5 , A , B , C , D , E , F , G , H , I , J , K , L , M , N , O , P , Q , R , S , T , U , V , W , X , Y , Z
Get Listed: If your company is not currently listed, you can do so electronically or by contacting RBAC staff at the numbers below.
You might also want to to consider listing materials available/wanted on NC WasteTrader, North Carolina's marketplace for discarded or surplus materials or products.
Check out our interactive North Carolina Material Recovery Facilities map.
Need Help? Please visit our help page or contact the RBAC Market Development Team at (919) 715-6500 or (800) 763-0136.
NCDENR
RBAC Homepage | DENR Homepage | DPPEA Homepage | DOC Homepage
This directory is produced by the North Carolina Recycling Business Assistance Center (RBAC) in the Division of Pollution Prevention and Environmental Assistance (DPPEA).
Done
Internet

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Recycling vendors

Vendor Name:	Vendor Type	Material Recycled by Vendor
Waste Management	Solid waste and Recycling vendor	Office paper, plastic soda bottles, alunimun cans
Renew Resources, LLC Or Industrial Service Solutions, LLC	Recycling Specialty company.	Floor rubber, vinyl, window rubber, Skirt rubber, misc. plastics, electrical shipping cartons, reusable oil rags and absorbents mats program.
Meyers Forest Products	Wood recycler	Pallets and wood packaging
A+ Forest Products	Wood recycler	Pallets and wood packaging
OmniSource Southeast	Solid Waste broker	Industrial waste TSD
Harmony Plastics	Plastics recycling	Shrink wrap, packing strap, misc plastics, foam insulation
City of High Point Recycling	Household Residential recycler	Glass and some other standard items that are too small of stream to otherwise manage.
Recycle America	Recycling Vendor – owned by Waste Management.	Aluminum cans, plastic soda bottles, office paper
Brent Industries	Industrial laundry	Solvent/oil rag recycler
EQ	Mobile Solvent Recycling	MEK onsite distillation for reuse.
OMNI-Source SE, Atlantic Steel	Metal Recycler	Aerosol can and metal recycling
Industrial Container Inc.	Drum recycler.	MT Drum recycling
VLS and GRRR	Nonhazardous waste TSD and Cement kiln	All non-recyclable waste are sent for energy generation.

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Waste Management **Metrics & Cost** review.

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Financial Summary

- The cost of land-filling waste in 2008 was more than recycling and sending waste materials to waste-to-energy, (W-T-E) combined in 2010.

- The facility is paying **56% <u>less</u>** in disposal cost overall.
  This due largely to the income from the recycling of previously wasted materials and the reduction in waste creation caused by this initiative.

  - **(Cost per ton disposed =>**
    - **~$90/ton landfill versus**
    - **Cost per W-T-E = ~$250/ton. + Recycle (revenue) = ~$55/ton**

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Recyling revenue streams and cost reductions

- Wood savings by recycling = $22,000 annually
- Cardboard/paper savings by recycling = $65,000 annually
- Solvent savings due to recycling = $60,000 annually
- Electronics disposal at net zero cost = $5000 annually
- Elimination of waste generated before = 108 lbs./bus reduction
- Net cost difference due to recycling and WTE - >
  - Wast management cost>
    2006 = $39.86 per bus and now in...> 2010 = $17.29 per bus

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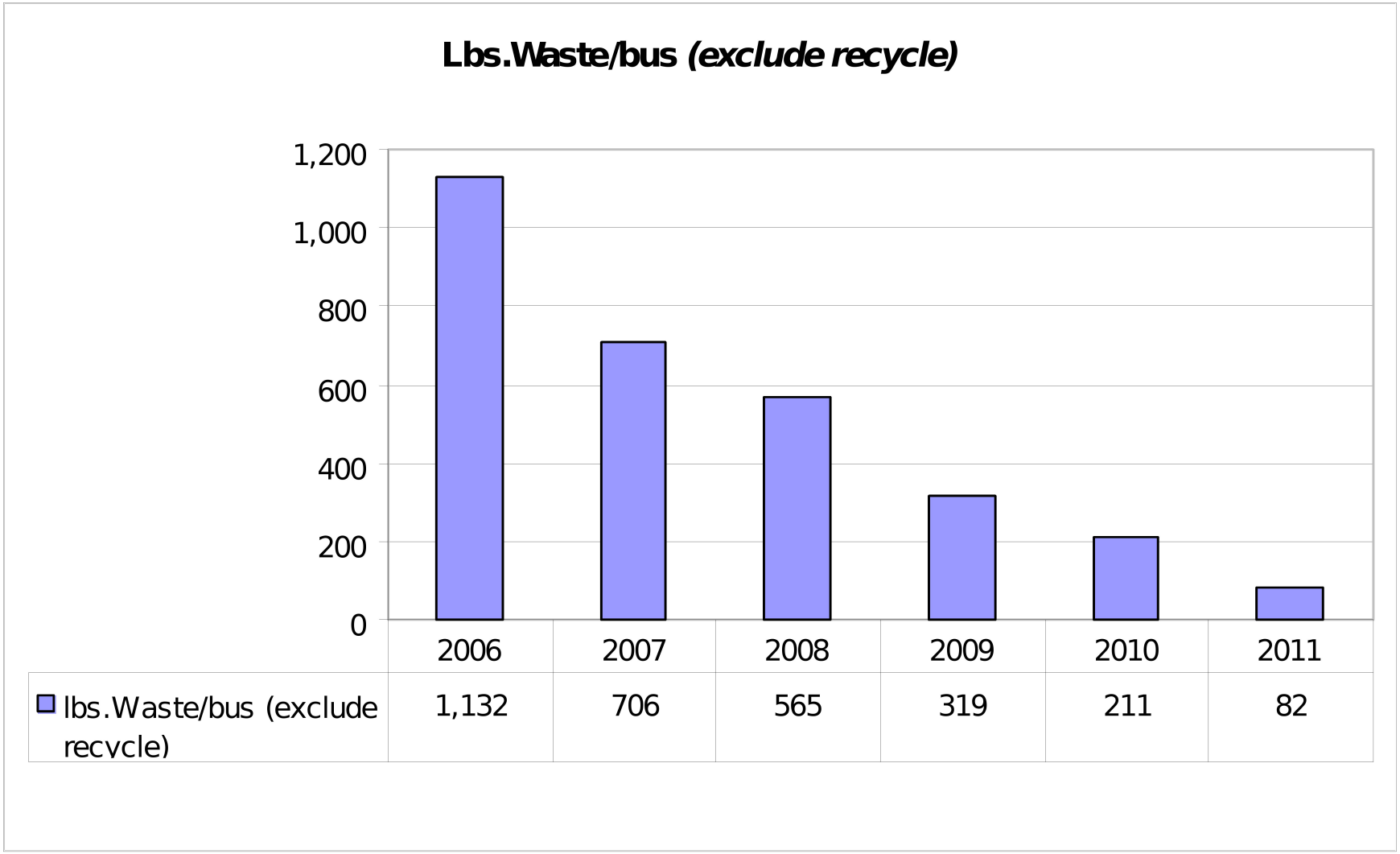
Total Materials Disposed per year



As of 2011, all waste goes to Waste-to Energy

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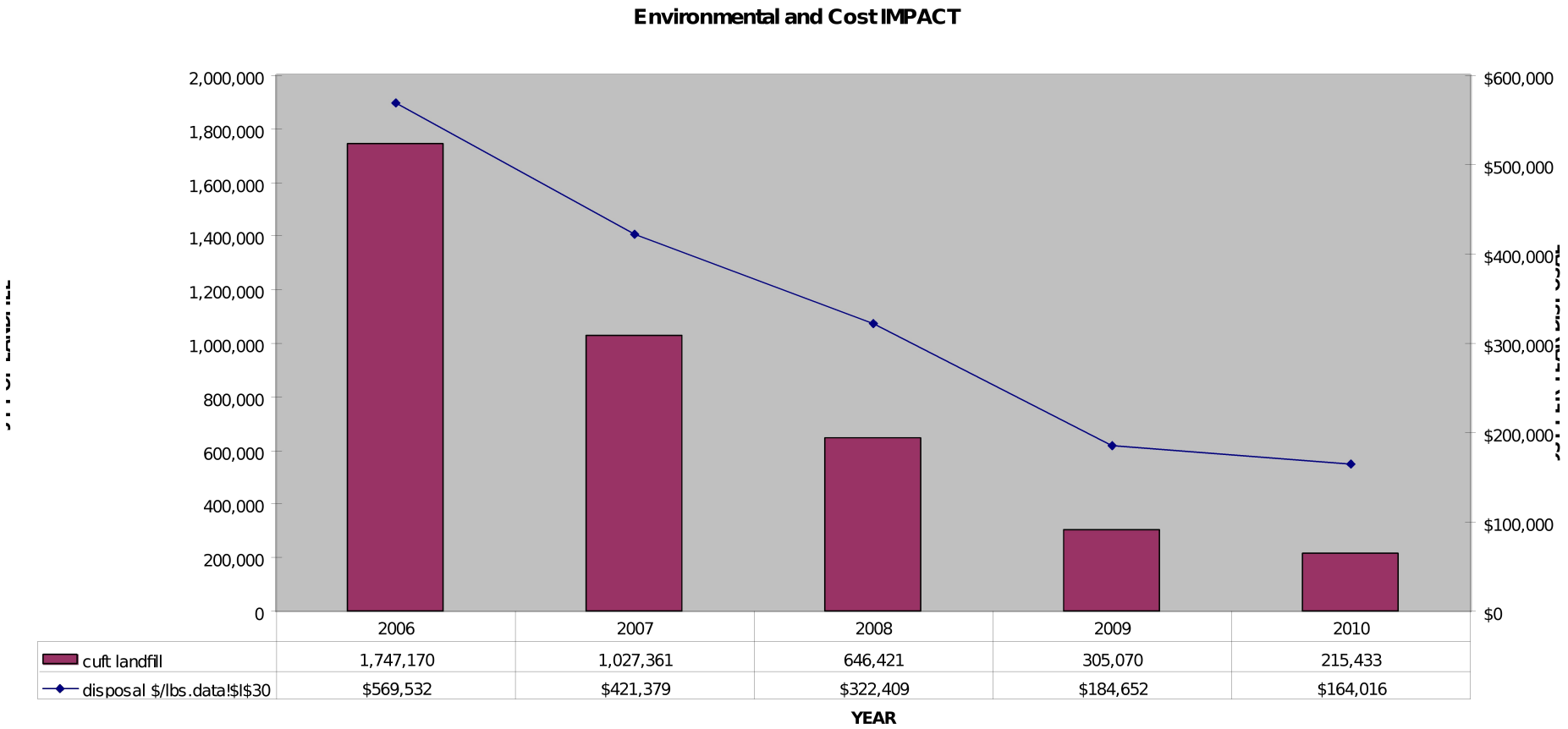
Impact Summary



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Thomas BUILT BUSES®

Because every mile matters.℠

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Sustainability Initiatives:

Solar and Fuel Efficient Vehicles

Because every mile matters.SM

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SCHOOL BUS
SCHOOL BUS
YBRID
C2e

1916–2011

95th

ANNIVERSARY

Passion | Respect | Discipline | Integrity